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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/749,926	12/29/2000	Kazuhiro Takahashi	35.G2735	6871

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EXAMINER

NGUYEN, HUNG

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,926

Applicant(s)

TAKAHASHI ET AL.

Examiner

Hung Henry V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2000.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed July 15, 2002 regarding a pending application Serial Number 09/013, 201 filed January 26, 1998 is acknowledge. This application has been reviewed and it has been placed in the application file but will not be printed because it is not a Published Patent Document.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 7-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi et al (U.S.Pat. 5,892,573).

With respect to claims 1, 8 and 12, Takahashi et al (fig.1) discloses an exposure apparatus and method comprising all basic features of the instant claims such as: a light source (1) comprises a pulse light; an illumination optical system (2, 3, 20-21, 5-8) for illuminating a predetermined pattern formed on reticle (R); a projection optical system (10) for projecting the pattern formed on the reticle onto a substrate (W); a first photodetector (12) disposed in a portion for receiving light from an optical path between the light source and a portion where the reticle is positioned for monitoring an emission light amount from the light source and light processing systems (102-103) for processing the detected signal from the first light quantity detector (12)

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and correcting the coefficient/output energy (see col.5, lines 65-67 and col.6, lines 1-5; col.7, lines 1-4).

With regard to claims 2-5, 7, 9-11 and 13, Takahashi et al further teaches the processing system further performs sensitivity correction of the first photo detector relative to an illuminance on a plane corresponding to a surface of the substrate in accordance with the estimated change of transmissance (see col.6, lines 20-34); a reticle stage (9) for holding and driving the reticle in a direction perpendicular with the optical axis of the illumination optical system ; a second photo detector (13) having a light receiving surface placed at the height of the substrate for detecting the exposure light passing thru a light transmittance portion the reticle stage; an ND filter (20) and a masking plate (6) and the processing system determines the changes in the transmissance of the illuminating system and the projection optical system.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al (U.S.Pat. 5,892,573).

With regard to claim 6, Takahashi et al (fig.1) discloses a projection exposure apparatus/method comprising substantially all of the limitations of instant invention as discussed above. Takahashi et al does not expressly disclose the processing system that determines the change in transmissance of the illumination optical system and the projection optical system

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based on “information regarding output energy per pulse, an oscillation frequency and oscillation duty of the pulsed laser and voltage applied to the pulsed laser, a transmittance of the ND filter and the reticle, and the illumination extent formed by the masking plate”. However, Takahashi noted “ the masking blade 6 is moved to effect light blocking in an appropriate range” (see col.6, lines 60-61); “Optimum transmissivity of the ND filter 20 can be calculated by the light quantity calculating means 102” (see col.7, lines 40-42); the output voltage applied to the pulsed laser as well as the pulse emission frequency of the light source is set by control system 103 (see col.6, lines 65-67 and col.8, lines 20-26). In view of such teachings, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Takahashi et al to obtain the invention as specified in claim 6. It would have been obvious to a skilled artisan to estimate the changes in the transmissance of the illumination optical system and the projection lens in accordance with those well known parameters so that the proper exposure amount can be accurately calculated and thus improving the quality of the images to be printed.

Response to Amendment

6. Applicant's amendment filed July 2, 2002 have been entered. Claims 1, 2, 4, 6-12 have been amended. Applicant's amendment is sufficiency in overcoming the rejection of claims 4 and 10 under 35 U.S.C. 112, second paragraph. Turning to the prior art rejection, limitations of amended claims overcome prior art of Nishi but are still read on the reference of Takahashi et al 's 573. Applicant's arguments with respect to reference to Takahashi et al (U.S.Pat. 5,892,573) have been carefully reviewed but they are not persuasive. The applicant is reminded that the claimed subject matter to examination will be given their broadest reasonable interpretation

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consistent with the specification, and limitations appearing in the specification are not be read into the claims. *In re Yamamoto*, 740 F. 2d 1569, 1571, 222 USPO 934, 936 (Fed.Cir. 1984).

With this in mind, the discussion herein will focus on how the terms and relationships thereof in the claims are met by the references. Response to any limitation that is not in the claims or any argument that is irrelevant to or does not relate to any specific claimed language will not be warranted.

In response to Office Action, applicant has amended the independent claims 1, 8, 12 that add the limitations of “changing a proportional coefficient of a target value...in accordance with a change of transmittance of at least an optical element between said light source and said first photodetector” Then, applicants argued that Takahashi et al’ 573 fails to disclose or suggest anything about changes in transmittance of optical elements between a light source and a first light quantity detector, and Takahashi’s first, second and third ratios fail to suggest the feature of changing the proportional coefficient of a first photodetector output according to a change in transmissance of at least one optical element between a light source and the first photodetector as in amended claims 1, 8 and 12. The Examiner respectfully disagrees with applicant’s interpretation. Takahashi’s 573 meets all of the limitations as amended. As clearly illustrated from figure 1 of Takahashi, photodetector (12) is placed between the light source (1) and mirror (8) for receiving the light from an optical path between the light source and a portion where the reticle/original (R) is placed, the photodetector (12) monitors an emission of light from the light source (see col.4, lines 43-48). One having ordinary skill in the art would understand that the optical elements preceding photodetector 12 are optical elements through which exposure light passes. If changes in transmittance of optical elements preceding photodetector 12 occurs, the

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exposure amount reaching photodetector 12 change. It is noted by the Examiner that a change in the transmissivity of the illumination optical system (100) is “a change of transmittance of at least an optical element between the light source and the first detector” and is monitored by photodetector (12) regardless of whether or not the reticle/original is disposed in the path of exposure light or not. Takahashi et al’ 573 clearly states that “*the transmissivity of optical components varies due to irradiation with exposure light from the light source*, it results in a difference between the actual light quantity on wafer W and the light quantity as predicted *from the output signal S1 of the first detector 12* (see col.9, lines 48-50). The applicant is also directed to column 10, lines 1-7 of Takahashi et al’ 573. Therein it is clearly disclosed that the output signal S1 from the photodetector 12 suggest changes in transmittance of the illumination optical system (100) which is a change of transmittance of at least an optical element between the light source and said light photodetector as amended. Furthermore, Takahashi et al’s 573 teaches correcting light quantity error due to variation with time of the optical components, output signals from the first photodetector 12 applied to the light quantity calculating means 102 and control system 103 to calculate a correction coefficient and adjust the voltage applied to the light source (see col.5, lines 62-67 and col.13, lines 46-51).

With regard to dependent claims 3-7, 9-11 and 13, the limitations of these claims are clearly discussed in sections 2 and 4 of the Office Action, and it is noted that the applicants do not separately argue the distinct patenability of these claims. Thus, the Examiner assumes that dependent claims of the instant application are not additionally patentable over and above the patentability of independent claims.

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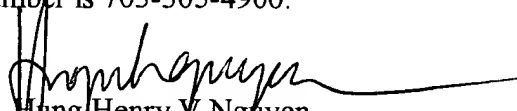
7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.


Hung/Henry V Nguyen
Examiner
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hvn
September 20, 2002